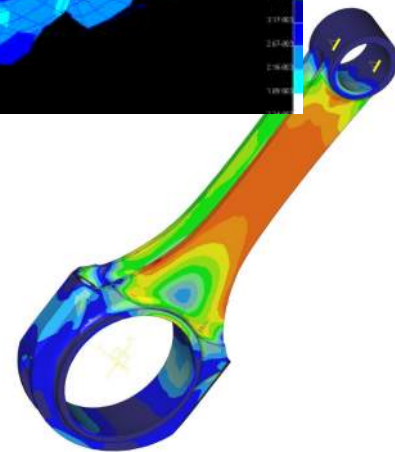
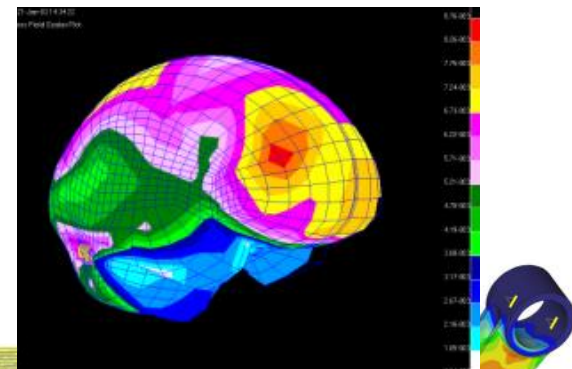




Mechanical Engineering

Dr. Neal Murphy

November 7th 2025



What do mechanical engineers do...?

Power generation



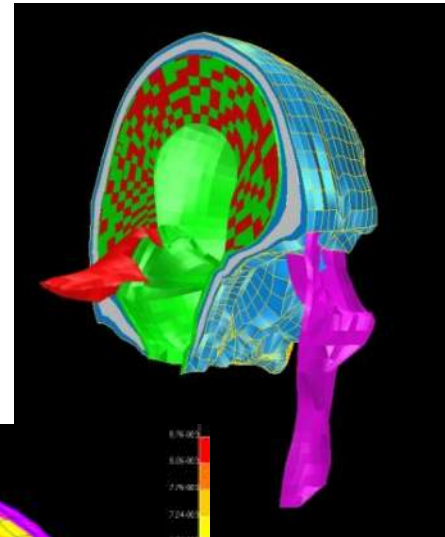
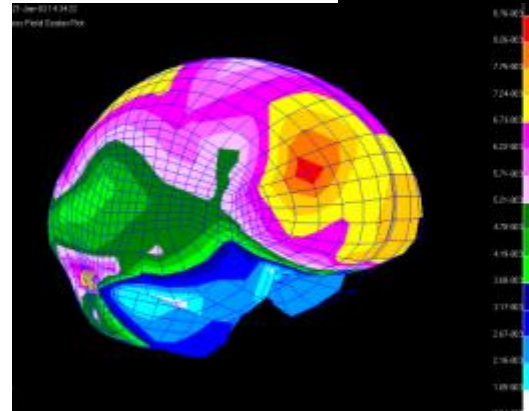
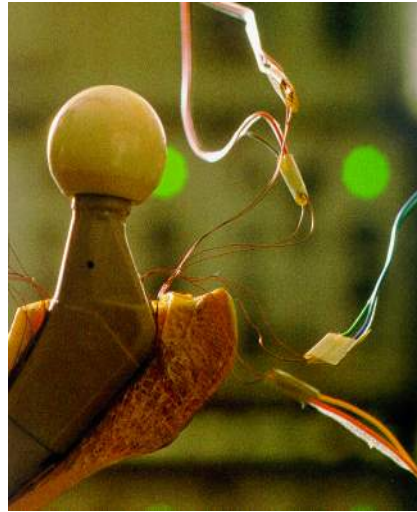
What do mechanical engineers do...?

Transport



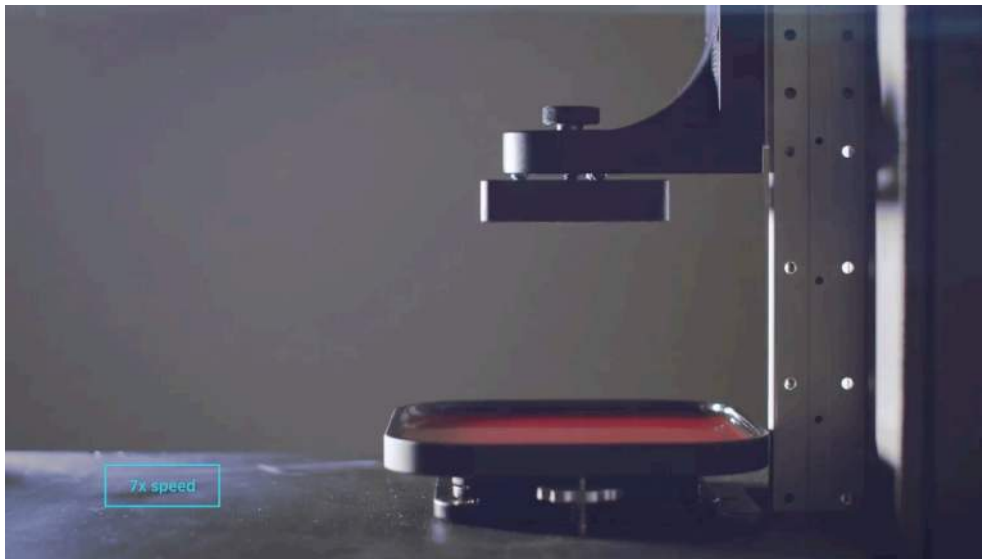
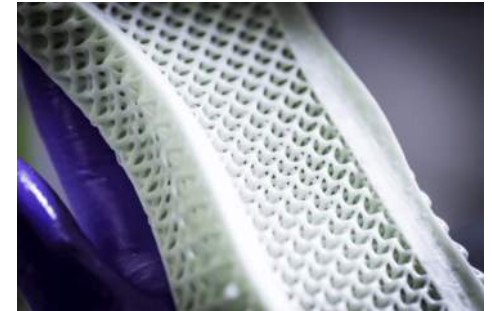
What do mechanical engineers do...?

Biomedical



What do mechanical engineers do...?

Manufacturing



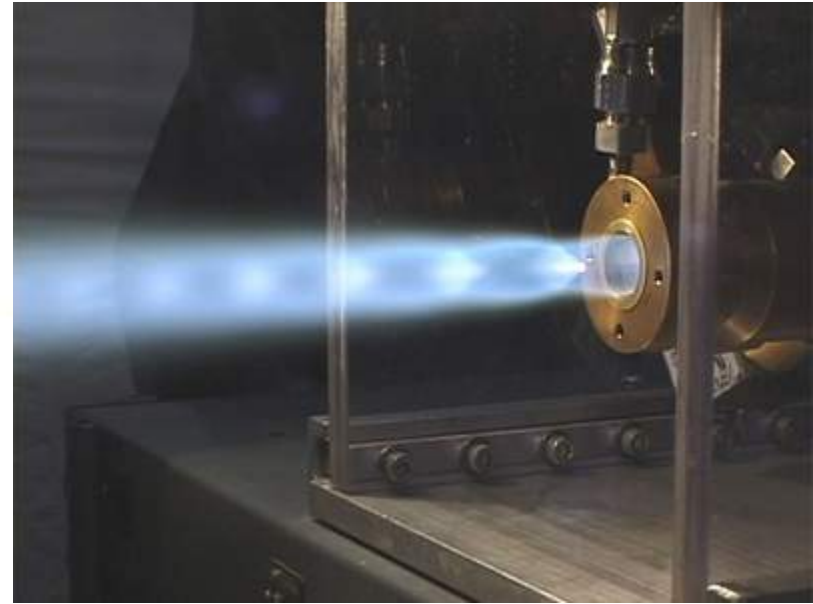
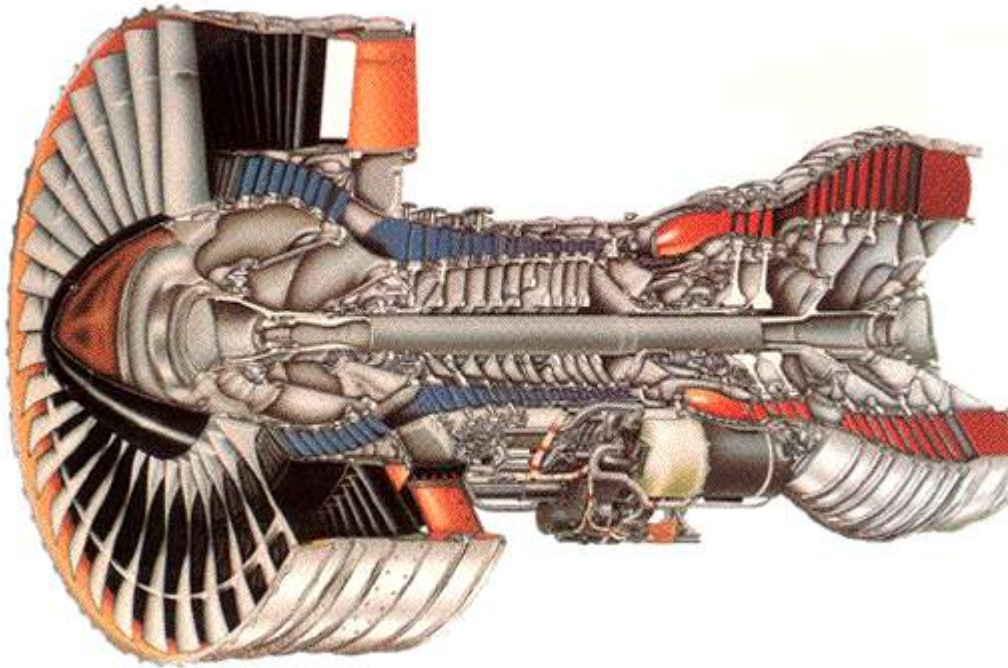
What do mechanical engineers do...?

Management



What will you study..?

Thermodynamics



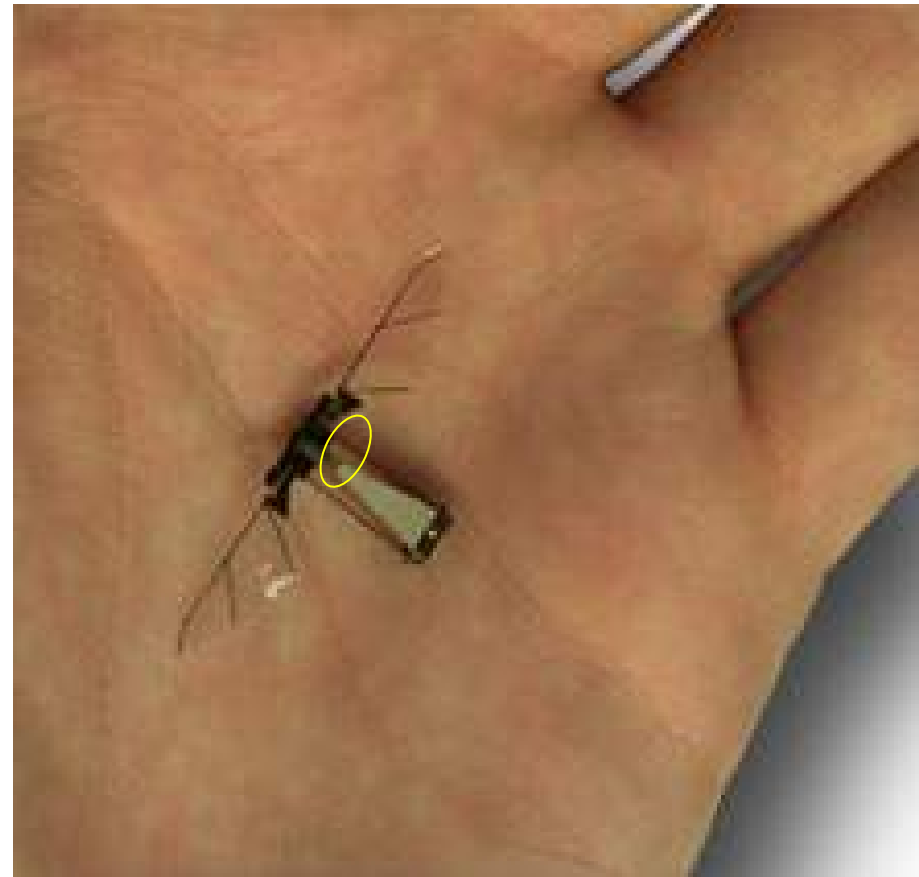
What will you study..?

Dynamics



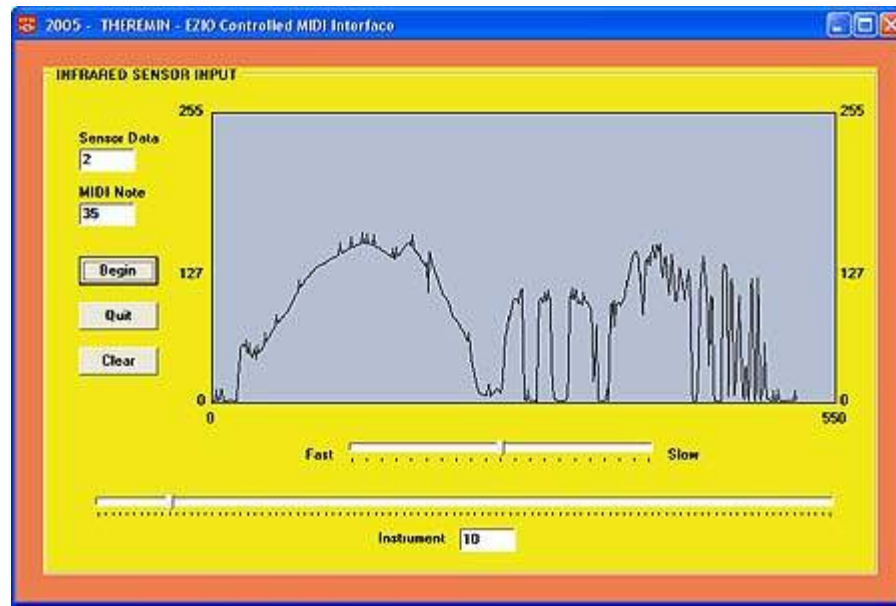
What will you study..?

Control



What will you study..?

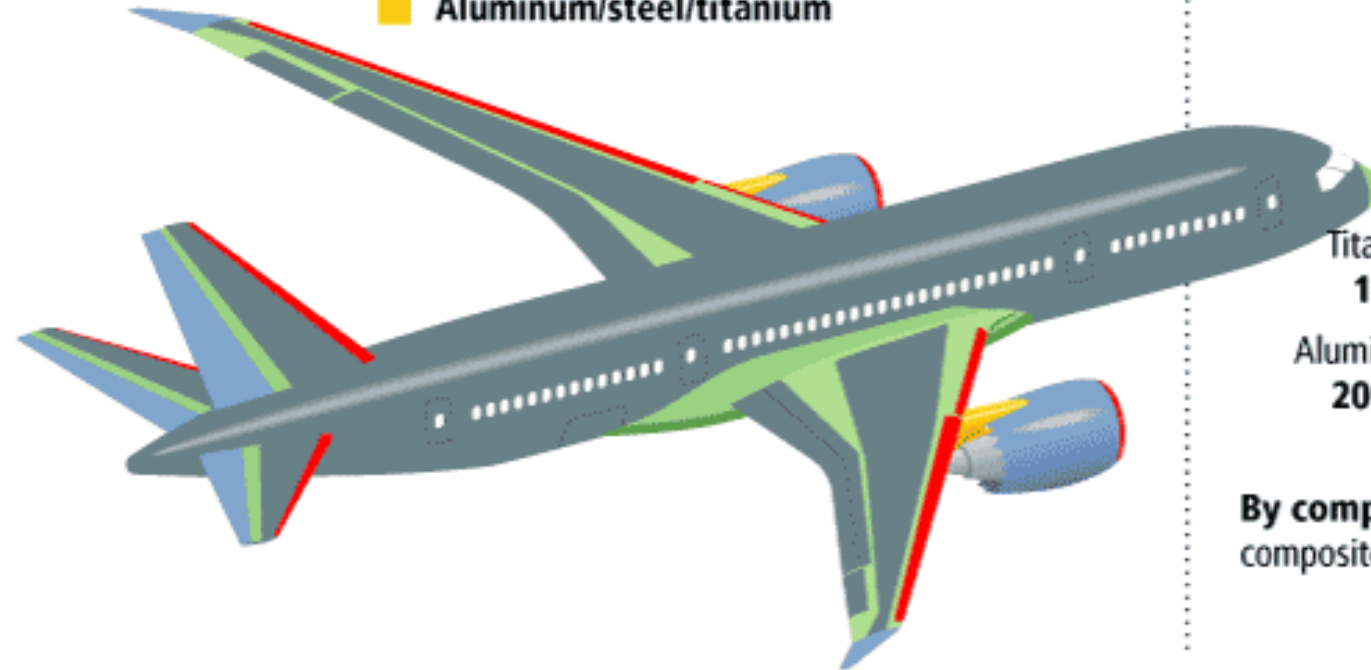
Electrical and Electronic engineering



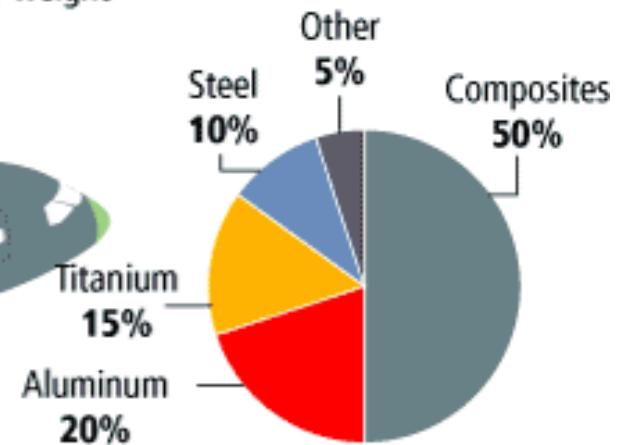
What will you study..?

Materials

Materials used in 787 body



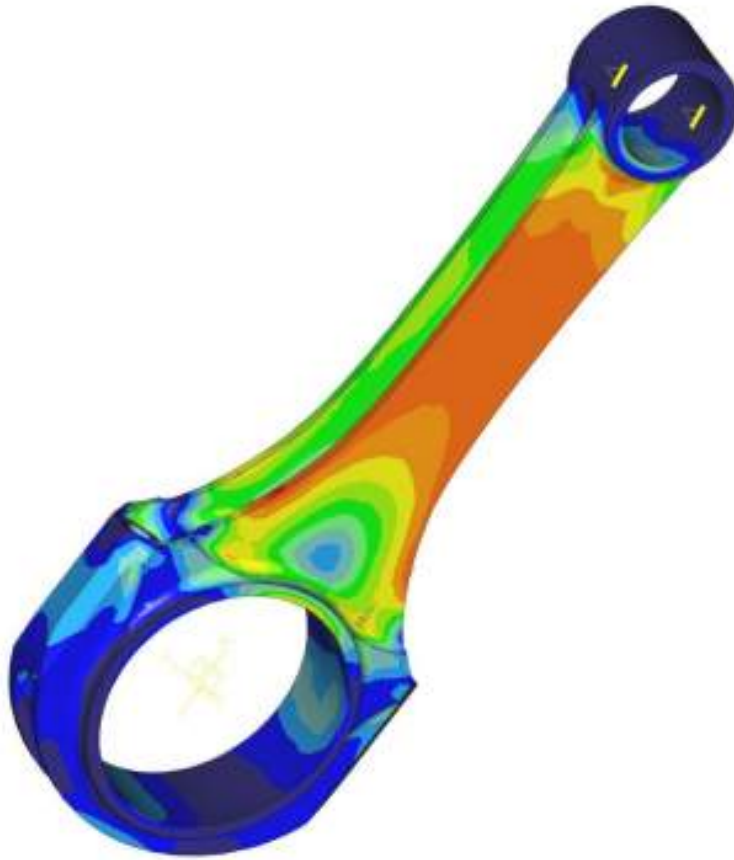
Total materials used By weight



By comparison, the 777 uses 12 percent composites and 50 percent aluminum.

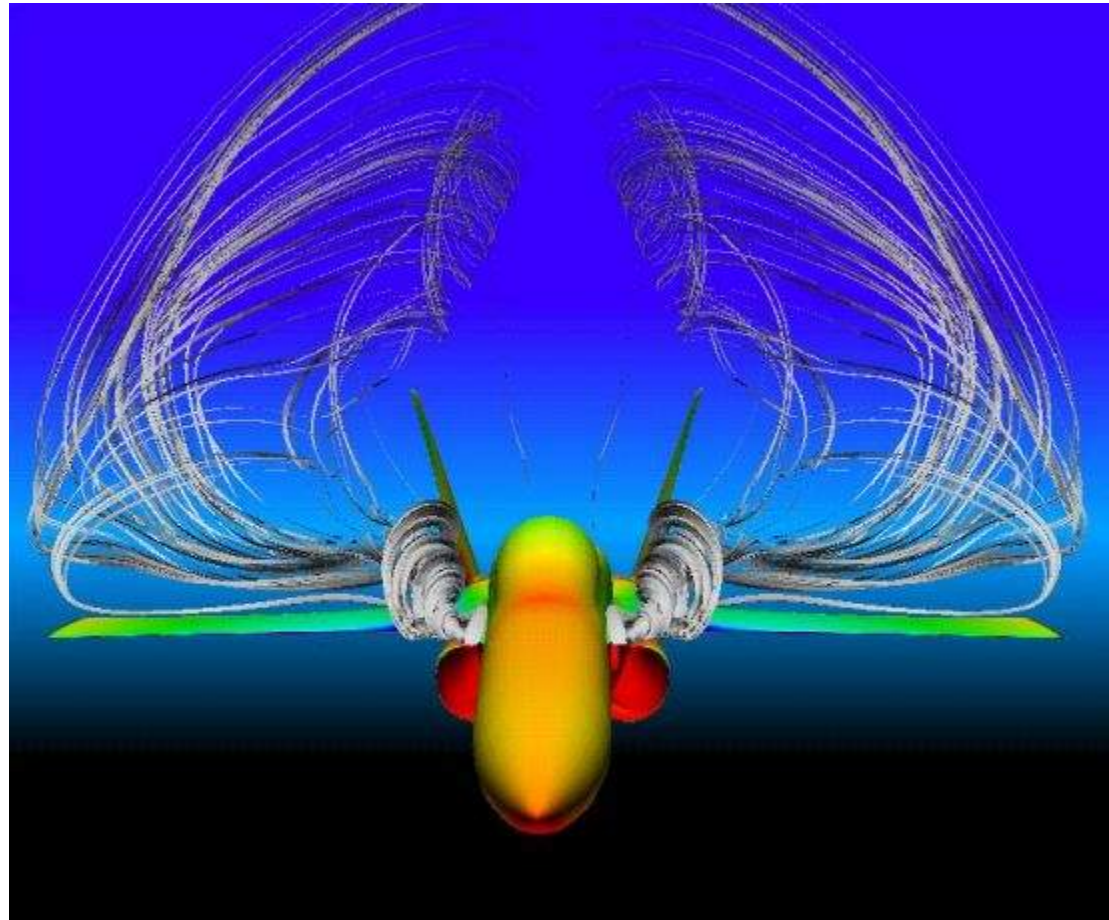
What will you study..?

Mechanics of Materials

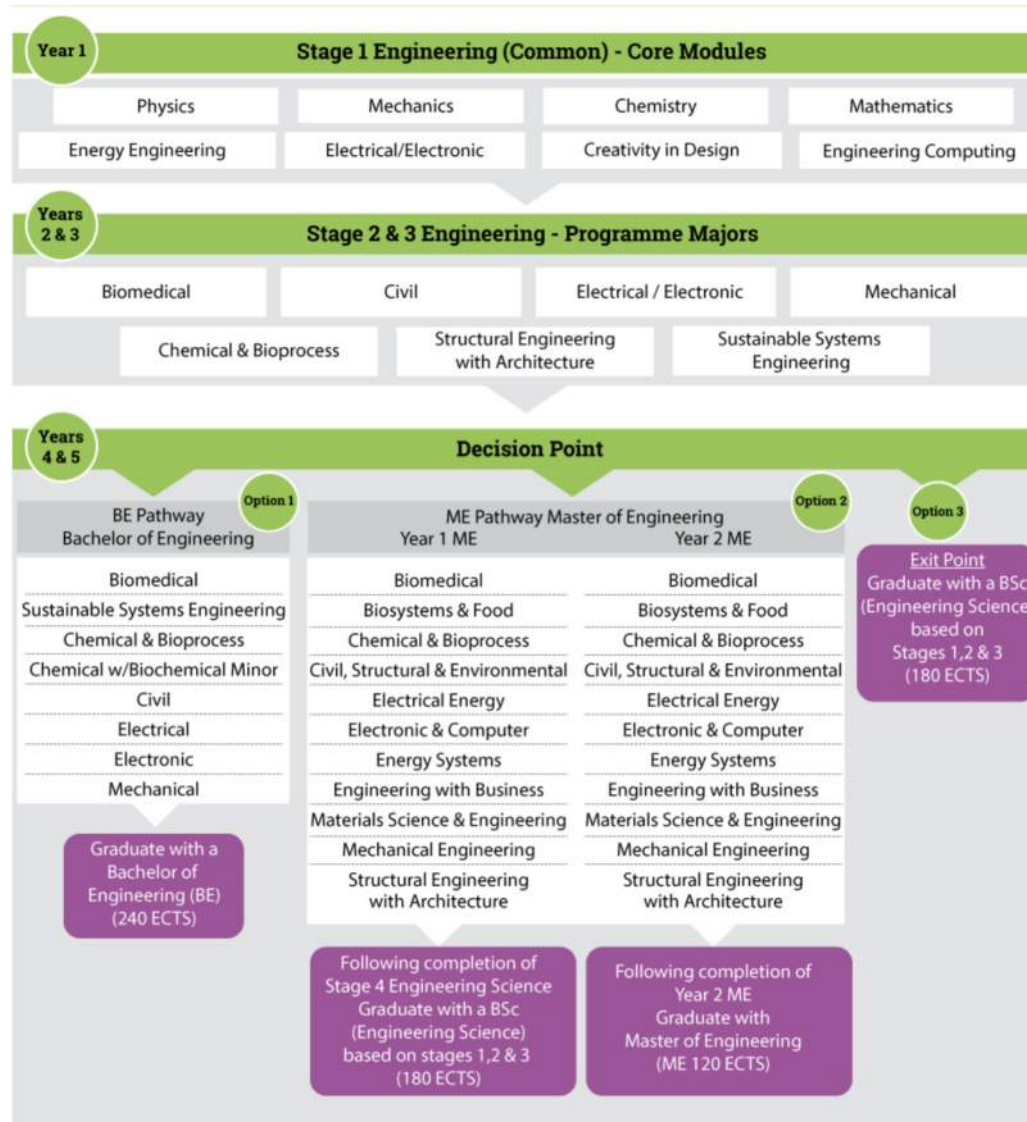


What will you study..?

Fluid Mechanics and Heat Transfer



Engineering Pathways



UCD Engineering Degree Programme Pathways

Years
2 & 3

Choose your pathway

Chemical & Bioprocess

Civil

Electrical/Electronic

Mechanical

Biomedical

Structural Engineering
with Architecture

Optional Study Abroad

Years
4 & 5

Focus on your area(s) of specialisation

BE (4 years)
Bachelor of Engineering

Biomedical
Chemical & Bioprocess*
Civil
Electrical
Electronic
Energy Systems
Mechanical

Graduate with
a Bachelor
of Engineering

ME (5 years)
Master of Engineering

**Biosystems & Food Engineering
Biomedical
Chemical & Bioprocess Engineering
Civil, Structural & Environmental
Electrical Energy
Electronic & Computer
Energy Systems
Engineering with Business
Materials Science
& Engineering
Mechanical
Structural Engineering
with Architecture
Professional Work Experience

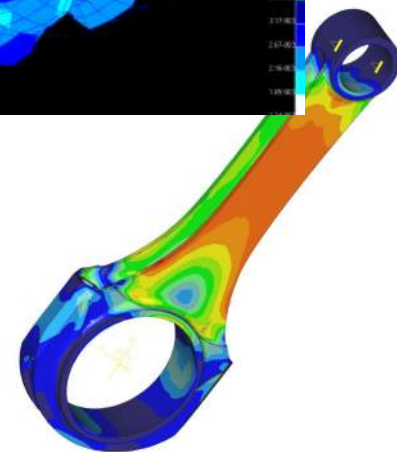
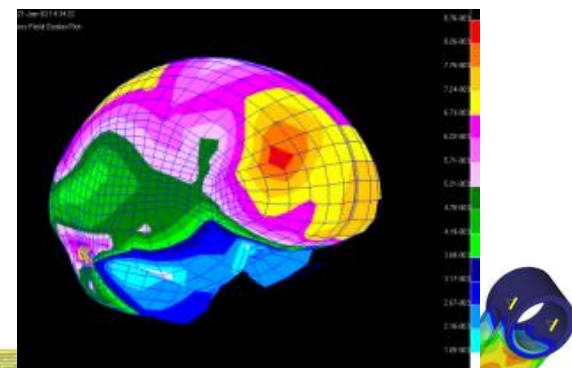
Graduate with
a Master
of Engineering



Mechanical Engineering

Dr. Neal Murphy

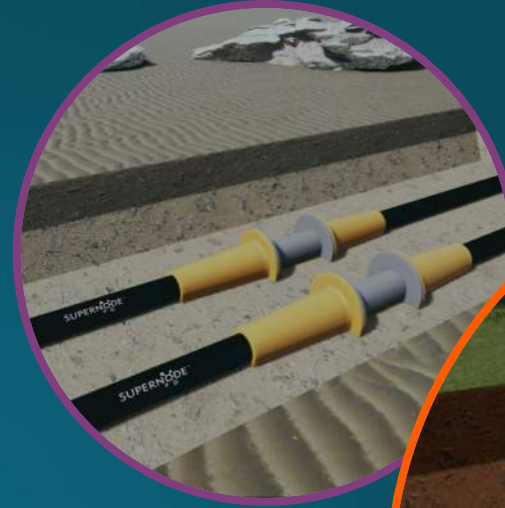
neal.murphy@ucd.ie





MECHANICAL ENGINEERING

Peter Stringer BE
CTO



WHO AM I?

Growing up I was interested in how things worked.

Sat where you are in 2002

Graduated from UCD in Mechanical Engineering in 2006

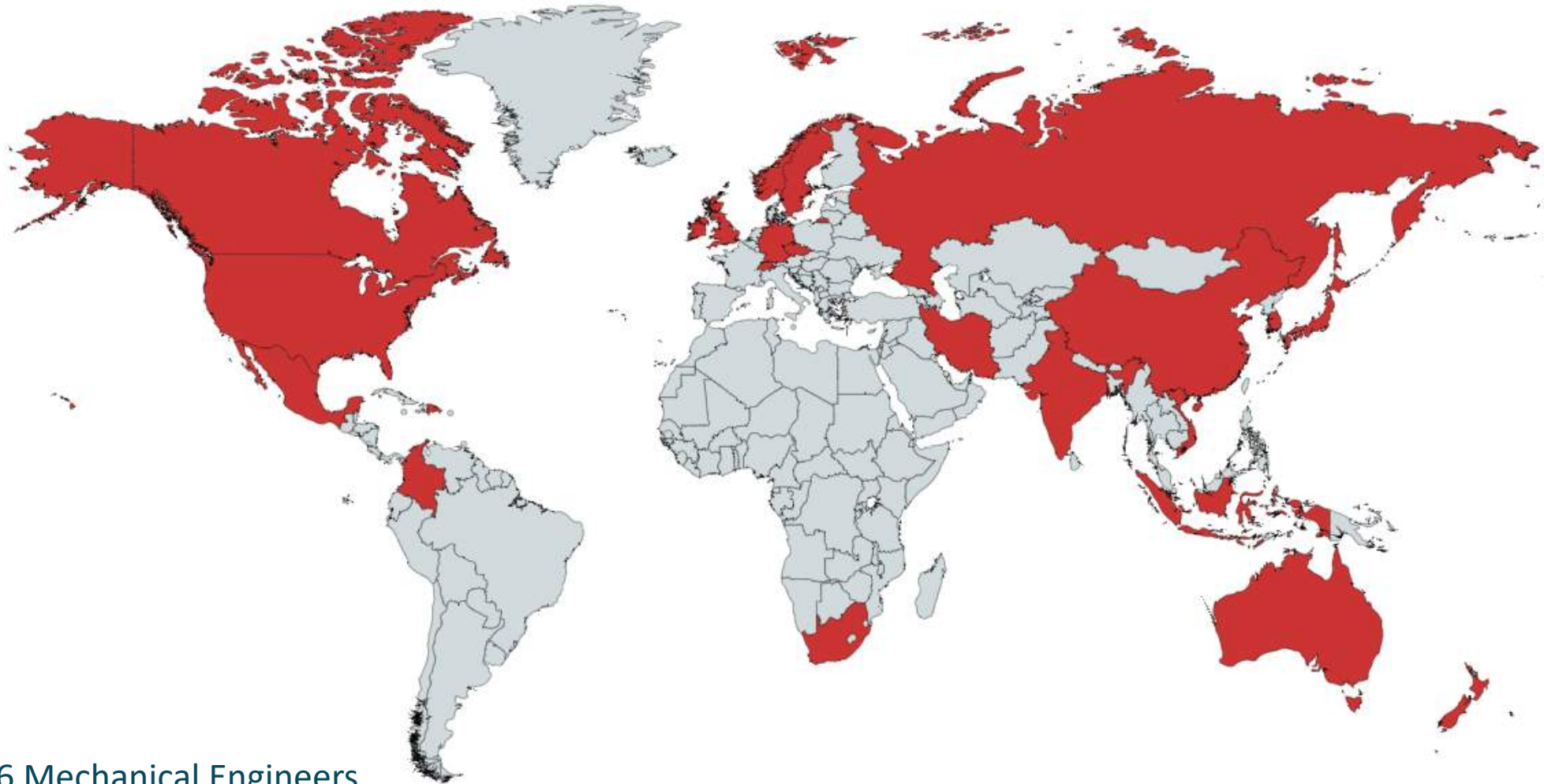




WHAT DO MECHANICAL ENGINEERS DO?

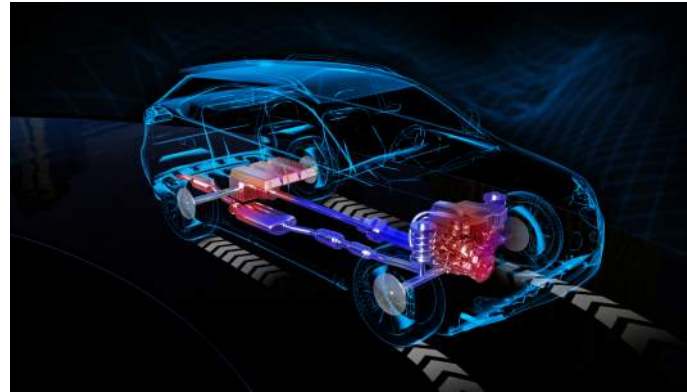


WHAT DO MECHANICAL ENGINEERS DO?



Where have 16 Mechanical Engineers
worked since graduating in 2006

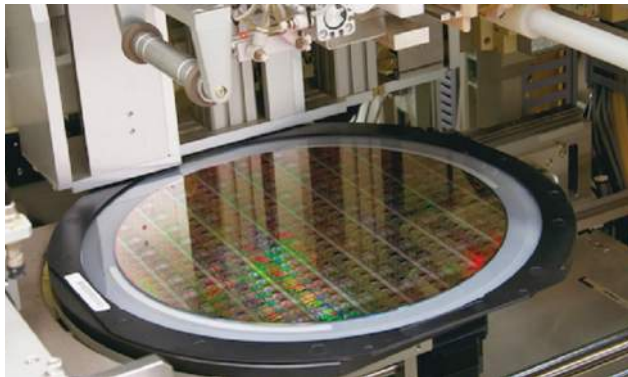
WHAT DO MECHANICAL ENGINEERS DO?



WHAT DO MECHANICAL ENGINEERS DO?



WHAT DO MECHANICAL ENGINEERS DO?



WHAT DO MECHANICAL ENGINEERS DO?



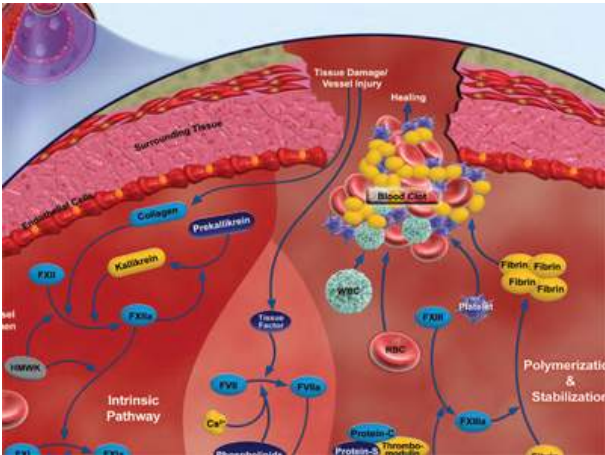
What industries have 16 Mechanical Engineers worked since graduating in 2006



AND WHAT HAVE I DONE?

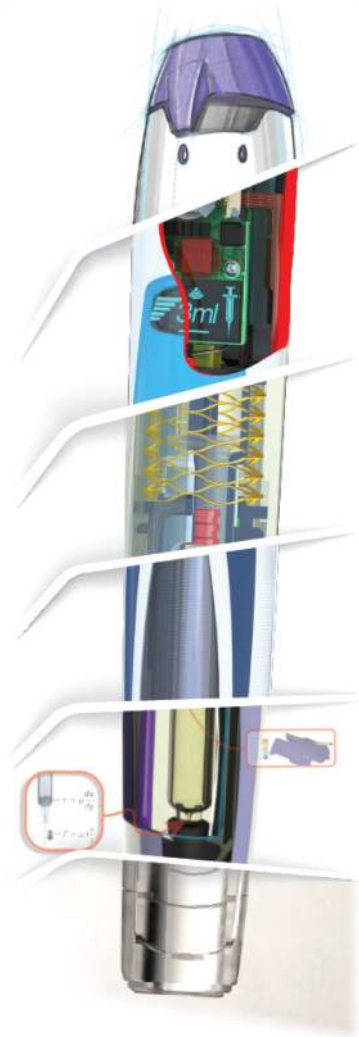
WHAT HAVE I DONE?

stryker®



WHAT HAVE I DONE?

JABIL



WHAT AM I DOING NOW?

How do I leave the world a little better?

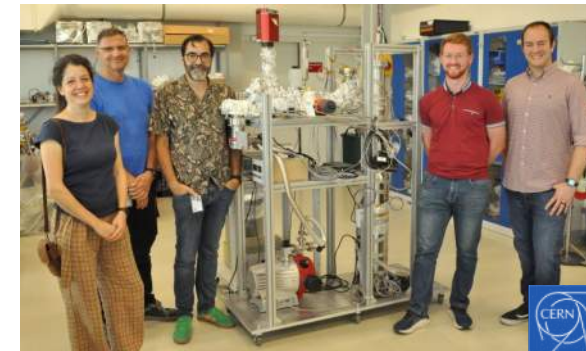
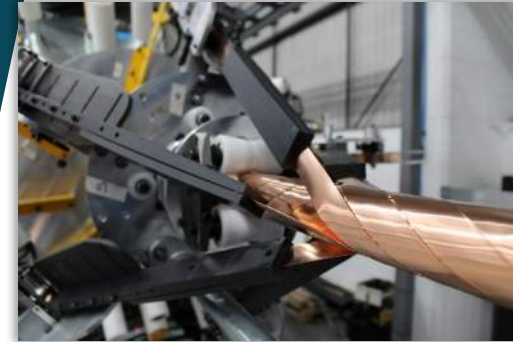
How do we reduce the amount of CO2 we emit?

How do we move renewable power from the peripheries of Europe to the population centres?

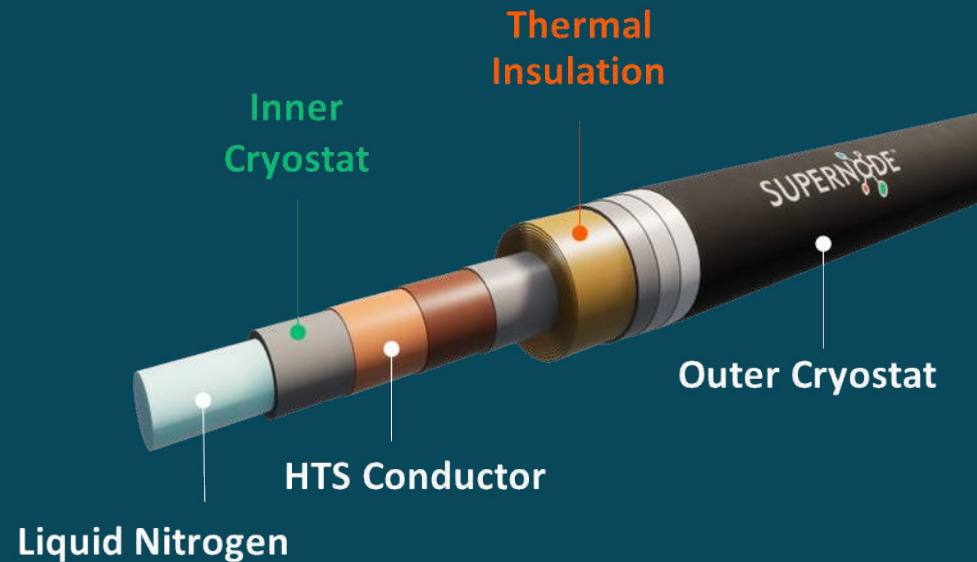


WHAT AM I DOING NOW?

- Define Tech Strategy
- Lead a team
- Mentor & Develop people
- Drive product development
- Guide technical projects
- Develop budgets
- Develop relationships with companies



WHAT SKILLS HAVE I USED?



- Materials Science
- Electronic & Electrical Engineering
- Applied Dynamics and Control Systems
- Engineering Failure Analysis
- Thermodynamics & Heat transfer
- Mechanics of Fluids
- Mechanics of Solids
- Mathematics
- Physics
- Chemistry
- Design
- Manufacturing Engineering
- Project management
- Computer Science
- Presentation skills

WHAT IS A TYPICAL DAY?

Dan – Graduated 2023

Learning:

- About how composites
- Handling of LN2 & design for cryogenic temperatures
- About the influence of cryogenic temperatures on material behaviour.
- Developing and using ANSYS models to optimise components to achieve target performance.

Materials & Design:

- 3D Modelling in Solidworks & OnShape
- Making prototypes using 3D printers
- Test method development and rig design to assess component performance
- Identification and characterisation of novel materials

Commercial

- Visited external manufacturing sites + potential project locations.
- Attended conferences to develop business engagement
- Represented SuperNode in external projects globally

Brian – Graduated 2021

Design work

- CAD work, 3D printing, structural and CFD analysis.
- Vacuum analysis

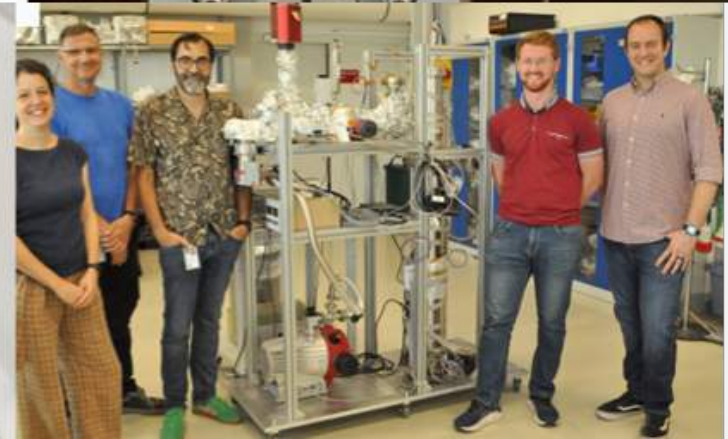
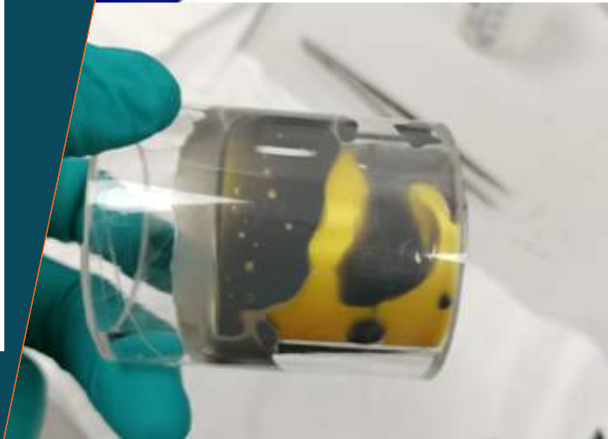
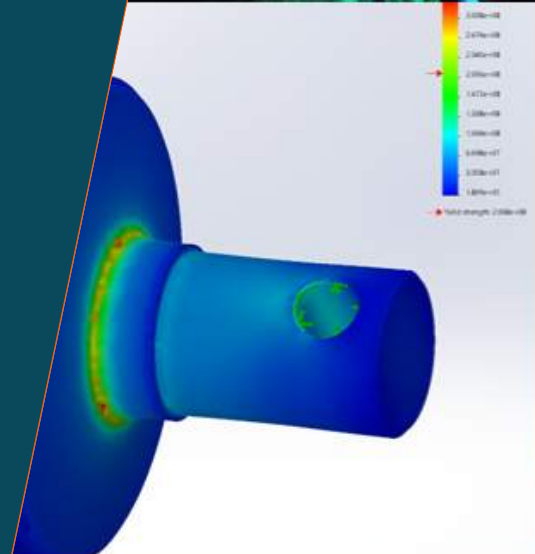
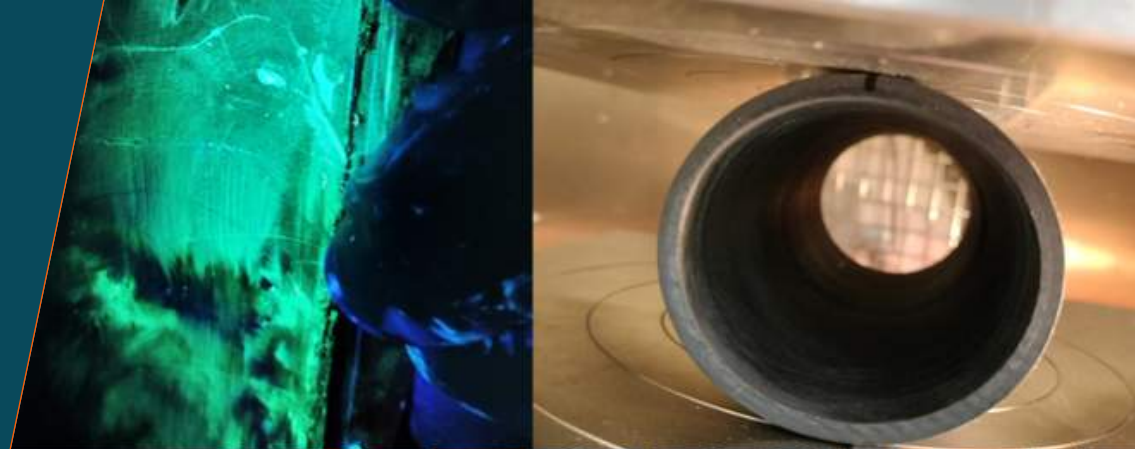
Process Development:

- Surface preparation techniques accelerated aging, adhesive selection, structural testing of adhesives.
- Building samples in ECCS and SCTC.
- Copper to HTS soldering.

Material Testing

- Lab testing of various materials in tension and compression.
- Working with LN2, testing at cryogenic temperatures.
- Seal testing

Worked at CERN



MECHANICAL ENGINEERING

Gives you:

- an approach to tackle anything
- a structure to contribute to solutions
- a broad knowledge you can build on

Mechanical engineers make the connections

